

DT12 Rec'd PCT/PTO 28 JAN 2005

ABRASIVE HOLDER

**TECHNICAL FIELD**

This invention relates to a system for holding an abrasive medium to a tool and in particular, though not solely, the invention relates to a system for effectively  
5 holding an abrasive medium to a sanding hand tool.

**BACKGROUND ART**

Sanding tools are used widely and available in a variety of shapes and sizes to suit their particular application or desired use. In general, it may be said that there are three main configurations utilised to locate and hold an abrasive material such  
10 as sandpaper in position against a supporting tool body (which may be a power tool or hand tool). These three types can be classified according to the following descriptions:

1. screw down clips or clamps to allow an abrasive material, such as sandpaper to be wrapped around the ends of the tool and clamped onto  
15 the tool by such screw-down clips or clamps; or
2. hook and loop systems (such as VELCRO®) with either hooks or loops provided on a base of the tool body and loops or hooks provided on the back surface of the sandpaper; or
3. various foam pads glued to a base of the body of the tool (i.e. the abrasive  
20 support portion of the tool) where the exposed or 'skin' side of the foam has applied thereto abrasives by, for example, pressure sensitive adhesive to allow it to stick to the foam. Foam pads may be made, for example, from Ethyl Vinyl Acetate (EVA) and may be incorporated in sanding tools having screw down clips of clamps or hook and loop fastening systems.

Foam pads provide a cushion between the tool and the surface to be sanded.

Problems exist with current sanding tool design, in particular as the types of tool configurations requiring screw-down clips or clamps for holding the abrasive material in place do not tend to facilitate simple abrasive material attachment. In addition, the present abrasive material holder systems generally make fitting of abrasive material a slow and fiddly process, and screw-down clamp type systems can result in wastage of abrasive material when attempting to ensure correct fitting of the material.

10 The hook and loop system of holding the abrasive material to a sanding tool can be expensive, and the tool system utilising EVA foam can be problematic due to foam materials being porous by nature and not therefore conducive to adhering abrasive material such as sandpaper thereto. It is known that since foams, such as EVA, are produced from moulds and subsequently cut into slabs, a shiny, or smoother skin surface occurs against the mould surface. This skin material, which is in general the off-cut from batch EVA production processes is conducive to adhering abrasive material such as sand paper thereto. The availability of this EVA skin material is however not currently sufficient to allow production of sanding tools on an industrial scale.

20 It is therefore an object of the present invention to provide an abrasive tool or a system for holding an abrasive medium to a hand tool which will go at least some way towards overcoming the above disadvantages or which will at least provide the industry and/or public with a useful choice.

Therefore, it is desirable to provide a system which may be utilised with sanding tools to provide a surface capable of attaching and providing a good adhesive surface for the adhesive backed abrasive material sheet whilst also being able to

provide a more economic and/or less awkward system for connecting together a sanding tool body and an abrasive material sheet.

All references, including any patents or patent applications cited in this specification are hereby incorporated by reference. No admission is made that any reference constitutes prior art. The discussion of the references states what their authors assert, and the applicants reserve the right to challenge the accuracy and pertinency of the cited documents. It will be clearly understood that, although a number of prior art publications are referred to herein, this reference does not constitute an admission that any of these documents form part of the common general knowledge in the art, in New Zealand or in any other country.

It is acknowledged that the term 'comprise' may, under varying jurisdictions, be attributed with either an exclusive or an inclusive meaning. For the purpose of this specification, and unless otherwise noted, the term 'comprise' shall have an inclusive meaning - i.e. that it will be taken to mean an inclusion of not only the listed components it directly references, but also other non-specified components or elements. This rationale will also be used when the term 'comprised' or 'comprising' is used in relation to one or more steps in a method or process.

Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

#### **DISCLOSURE OF INVENTION**

In a first aspect, the invention consists in an abrasive tool comprising:

a base portion, and

a plastics film layer on said base portion adapted to receive an abrasive material layer,

wherein said base portion includes a foam layer to which said plastics film layer is laminated.

Preferably, an abrasive material layer is applied to said plastics film layer.

Preferably, said abrasive material layer comprises abrasive material fixed to a backing layer wherein the backing layer is applied to the plastics film layer.

Preferably, said backing layer is provided with an adhesive to attach the abrasive material layer to the plastics film layer.

Preferably, the adhesive is a pressure sensitive adhesive.

Preferably, said foam layer is formed from ethyl vinyl acetate foam or polyethylene foam or polypropylene foam.

Preferably, said plastics film layer is formed from ethyl vinyl acetate film or polyethylene film or polypropylene film.

Preferably, said plastics film layer is applied to said foam layer by laminating during formation of the foam layer.

Preferably, a handle is connected to the base portion of the tool.

Preferably, the base portion is substantially planar.

Preferably, the base portion is flexible and means are provided on the tool for adjusting the curvature of the base portion and fixing the curvature of the base portion once adjusted.

Preferably, said curvature of the base portion may be concave or convex.

Preferably, said base portion is connected to a handle portion about a central pivot line and adjustment means are provided at respective spaced apart ends of the handle

portion to allow the ends of the base portion to be moved closer to or further away from the respective ends of the base portion.

Preferably, each said adjustment means has a pivotable connection with a respective end of the base portion.

Preferably, each said adjustment means comprises a screw member passing through a respective end of the handle portion and received within a socket pivotably connected to a respective end of the base portion.

Preferably, each socket is pivotable about a rod fixed within an end of the base portion, wherein the rod is fixed to the base portion substantially across the entire width of the base portion.

In a second aspect, the invention consists in an abrasive tool comprising:

a handle portion,

a flexible base portion connected to the handle portion about a central pivot line,  
and

adjustment spacing means provided at respective spaced apart ends of the handle portion, between the handle and base portions for adjustably fixing the distance between the handle and base portions at either end of the handle portion to thereby adjust the curvature of the base portion.

Preferably, said curvature of the base portion may be concave or convex.

Preferably, each said adjustment means has a pivotable connection with a respective end of the base portion.

Preferably, each said adjustment means comprises a screw member passing through a respective end of the handle portion and received within a socket pivotably connected to a respective end of the base portion.

Preferably, each socket is pivotable about a rod fixed within an end of the base portion, wherein the rod is fixed to the base portion substantially across the entire width of the base portion.

Preferably, a plastics film layer is provided on the outer surface of the base portion.

Preferably, the base portion includes a foam layer to which said plastics film layer is applied.

Preferably, an abrasive material layer is applied to said plastics film layer.

Preferably, said abrasive layer comprises abrasive material fixed to a backing layer wherein the backing layer is applied to the plastics film layer.

Preferably, said backing layer is provided with an adhesive to attach the abrasive material layer to the plastics film layer.

Preferably, the adhesive is a pressure sensitive adhesive.

Preferably, said foam layer is formed from ethyl vinyl acetate foam or polyethylene foam or polypropylene foam.

Preferably, said plastics film layer is formed from ethyl vinyl acetate film or polyethylene film or polypropylene film.

Preferably, said plastics film layer is applied to said foam layer by laminating during formation of the foam layer.

Preferably, the central pivot line is formed by a tongue-in-groove or dove-tail connection between the flexible base portion and the handle portion.

#### **BRIEF DESCRIPTION OF DRAWINGS**

ART 2  
Further aspects of the present invention will become apparent from the ensuing description which is given by way of example only and with reference to the accompanying drawings in which:

Figure 1A illustrates a side elevational view of one embodiment of a sanding tool incorporating an abrasive holder system according to the present invention;

Figure 1B illustrates a plan view of a sanding tool Figure 1A;

Figure 1C illustrates an end elevational view of a sanding tool Figure 1A;

Figure 2A illustrates a side elevational view of a second embodiment of a sanding tool in accordance with the present invention;

Figure 2B illustrates a plan view of the sanding tool illustrated in Figure 2A;

Figure 2C illustrates an end elevational view of the sanding tool illustrated in Figure 2A;

Figure 3A illustrates a side elevational view of a third embodiment of a sanding tool in accordance with the present invention;

Figure 3B illustrates a plan view of the sanding tool illustrated in Figure 3A;

Figure 3C illustrates an end elevational view of the sanding tool illustrated in Figure 3A;

Figure 4A illustrates a side elevational view of a fourth embodiment of a sanding tool in accordance with the present invention in an alternative configuration to Figures 1A, 2A or 3A;